

## Massachusetts CAPS Ecological Settings Variable Parameters – February 2021

Source: <https://umasscaps.org>

This document lists ecological settings variables with their GIS grid names and information on how they are used in the CAPS model. Ecological settings variables are used to determine resistance in Connectedness and Aquatic connectedness, and to determine ecological distance in Connectedness, Aquatic Connectedness, and Similarity. Settings variables are combined using the weights listed below for resistance and distance.

Settings variable	Grid name	Mixing <sup>1</sup>	Resistance	Distance
<i>Temperature</i>				
Growing season degree-days	degdays		0.3	1
Minimum winter temperature	mintemp		0.1	1
<i>Solar energy</i>				
Incident solar radiation	sun		0.1	1
<i>Chemical &amp; physical substrate</i>				
Soil pH	soilph		0.05	0.5
Soil depth	soildepth		0.05	0.5
Soil texture	soiltex		0.05	0.5
Water salinity	salinity	inflows	4	3
Substrate mobility	substrate		2	2
CaCO3 content	calcium	inflows	0.1	1
<i>Physical disturbance</i>				
Wind exposure	wind		0.1	1
Wave exposure	waves		0.5	1
Steep slopes	slope		1	1
<i>Moisture</i>				
Wetness	wetness	inflows	4	8
<i>Hydrology</i>				
Flow gradient	gradient	pond	1	2
Flow volume	volume	sumlogs	5	5
Tidal regime	tides		2	2
<i>Vegetation</i>				
Vegetative structure	structure		3	8
<i>Development</i>				
Developed	developed		1	20
Hard development	hard		2	1000
Traffic rate	traffic		40	
Impervious	imperv		5	
Terrestrial barriers	tbarriers		15	
Aquatic barriers	abarriers		100	

<sup>1</sup> Settings variables may be mixed for water bodies and wetlands in several different ways:

inflows: all cells in a water body or wetland get the sum of inflowing values

sumlogs: the same as inflows for log-scaled variables

pond: all cells in a water body or wetland get the mean of all non-missing values